

In re application: Jun Zheng
Filed: August 16, 2001
Response Dated 05/12/2003

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Serial N .: 09/931,669
Attorney's Docket: PAT036US
Reply to Office action of 02/12/2003

REMARKS/ARGUMENTS

Claims 1, 3-4, 6-7, 9-11, 13-15, 17, 21, 23 remain in this application. Claims 1-23 have been rejected. Claims 1, 3-4, 6-7, 9-11, 13-15, 17, 21, 23 have been amended and claims 2, 5, 8, 12, 16, 18-19, and 22 have been canceled, to more particularly point out and distinctly claim the subject matter of the present invention. Applicant hereby requests further examination and reconsideration of the application in view of the foregoing amendments and these remarks.

In the specification, one paragraph has been amended to correct minor typographical errors. No new matter has been added.

On page 2 of the Office Action, the Examiner rejected various claims under 35 U.S.C. § 112(2) as being indefinite. All the rejected claims have either been canceled or amended. Applicant submits that the pending claims, as amended, are not indefinite and that the § 112(2) should be withdrawn.

On pages 2-3 of the Office Action, the Examiner rejected claims 1-23 under 35 U.S.C. § 102(b) as being anticipated by Uchida (US 6057560). The independent claims have been amended to more clearly distinguish the claimed invention. The dependent claims have been canceled, or amended, to remain consistent with the amended independent claims. Applicant submits that the pending independent claims 1, 21, and 23, as amended, are not anticipated or suggested by Uchida, and are therefore in condition for allowance, as are their variously dependent claims. Independent claim 1, for example, specifies that the claimed invention is an **optically-pumped laser structure** comprising:

- a substrate;
- a bottom mirror disposed on the substrate;
- an **active region layer** comprising an **active region** and **active region layer portions outside the active region**, wherein the active region is adapted to be optically pumped and is disposed at its bottom surface on the bottom mirror and the active region is for emitting light generated therein out of its top surface; and
- a **heat-spreading layer** disposed directly on the top surface of the active region and on the top surface of the active region layer portions outside the active region, whereby some of the heat generated in the active region during optical pumping thereof is conducted from the top surface of the active region into the active region layer portions outside the active region via the heat-spreading layer.

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Applicant submits that these claimed features are not taught or suggested by Uchida. Uchida employs a mesa structure, so that the entire active region is isolated from others. There is no way for any heat to be conducted from the top of the active region of Uchida into the InP layer above it, since it does not extend laterally and contact the top surface of active-region layer outside the active region. Moreover, Uchida teaches an electrically-pumped VCSEL not an optically-pumped one, as claimed by Applicant. In Applicant's invention, the top DBR cannot be directly on top of the active region, since the OP laser has to pump into the active region through its top surface. The top DBR in Applicant's claimed invention is above the heat spreading layer, which is disposed on the active region layer. Contrasted to a conventional OP VCSEL, as illustrated in Fig. 1 of the Application, which has no way to remove heat from the top of the active region, Applicant's claimed invention can remove heat also from the top of the active region, because the heat-spreading layer conducts the heat from the top of the active region, and down into adjacent active-region layer material outside the active region itself. These feature are not taught or suggested by the cited references.

In view of the foregoing remarks and amendments, claims 1, 3-4, 6-7, 9-11, 13-15, 17, 21, 23, as variously amended, are believed to be in condition for allowance. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

The Assistant Commissioner for Patents is hereby authorized to charge any additional fees or credit any excess payment which may be associated with this communication to our deposit account 50-1705.

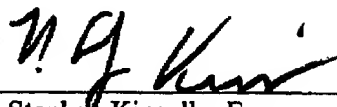
The undersigned may be contacted for any questions.

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Respectfully submitted,

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